

Remarks

Reconsideration and further examination of the above-identified patent application in light of the present Amendment, Reply, and Remarks is respectfully requested.

A Petition for an extension of time is enclosed along with the required extension fee.

Authorization is hereby given to charge any deficiency in fees or any other fees in connection with the above-identified patent application to our Deposit Account No. 23-0920.

The Specification has been amended. Specifically, paragraph [0001] of the specification has been amended to correct the serial number of one of the priority applications from "10/386,690" to - - 10/386,980 - -. This typographical error was made through inadvertence and mistake without intent to deceive. An updated application data sheet is also enclosed to update the information therein.

Claims 1-39 were pending prior to this amendment.

Claims 5-6, 8-10, 12, 14-15, 17, 21, 23-26, 29-30, and 34-36 have been canceled.

The matters objected to in Claims 1-39 have been corrected or canceled as per the Primary Examiner's requests in order to make the Claims more definite and clear and better comply with 35 USC 112, ¶ 2nd.

The matters objected to in Claim 10 have been corrected or canceled in accordance with the Primary Examiner's requests in compliance with 37 CFR 1.75(c).

Claims 1-4, 7, 11, 13, 16, 18-20, 22, 27-28, 31-33, and 37-39 have been amended to more particularly point out and distinguish applicant's invention over the references of record. Antecedent basis and support for the amended matter in the claims are found in the specification, original claims and drawings.

Claims 1-4, 7, 11, 13, 16, 18-20, 22, 27-28, 31-33, and 37-39 are presently pending for the consideration of the Primary Examiner.

Timely filed Terminal Disclaimers are enclosed in compliance with 37 CFR 1.321(c) to overcome an actual or provisional rejection based on a non-statutory double patenting ground. As indicated in the Terminal Disclaimers, the conflicting applications no. 10/386,980; application no. 10/339,264; and application no. 10/789,020 are

commonly owned with this application no. 10/753,947 as per the requirements of 37 CFR 1.130(b).

Accordingly, the enclosed Terminal Disclaimers obviate the provisional rejection of claims 1-2, 4, 12, 14, 16-17, 19, 27, and 29-30 under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1-2, 6, 10, 21-22, 26, and 28 of copending application no. 10/386,980.

Furthermore, the enclosed Terminal Disclaimers obviate the provisional rejection of claims 1, 5, 16, 20, and 34-39 under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1, 7-11, 19-21, 27-31, 40-47 and 50-52 of copending application no. 10/339,264 in view of Young U.S. Patent No. 6,561,640 B1 or Biegelsen et al. U.S. Patent No. 6,536,889 B1.

Moreover, the enclosed Terminal Disclaimers obviate the provisional rejection of claims 1, 6, 14, 16, 21, 29, and 34-39 under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1-6, 8-10, 13-18, 20, and 22 of copending application no. 10/789,020.

Claim 1 as presently amended pertains to an ultraviolet (UV) curing method for applying UV light to UV photo initiators in UV curable items comprising products, articles, inks, coatings, adhesives, or other objects. In the method of applicant's amended Claim 1, visible light is emitted from a set of visible light-emitting diode (LED) assemblies that are secured to a panel. A first wavelength of UV light is also emitted from a first array of UV LED assemblies that are also secured to the panel. A second wavelength of UV light is further emitted from a second array of UV LED assemblies that are secured to the panel. The second array of UV LED assemblies are different than the first array of UV LED assemblies. The second wavelength of UV light is different than the first wavelength of UV light. Advantageously, the panel is moved in proximity to or adjacent the UV curable items while light is emitted from the LED assemblies. Significantly, the first and second wavelengths of UV light are uniformly and concurrently applied and distributed on the UV curable items while visible light is emitted as the panel is being moved. Desirably, applicant's method provides for uniform curing of the UV curable items. Fortunately, applicant's method provides a uniform distribution of light across a linear plane by positioning LEDs in a row that will maintain an equal amount of light across a linear plane where the UV curable items can be passed

under them or where the light passes over them. This is important as the cure created by the UV light will vary as the intensity varies. Desirably, the physical properties of the finished cured items will be uniform if the UV light applied to the items is uniform.

Young U.S. Patent No. 6,561,640 B1 (“Young”), Biegelsen et al. U.S. Patent No. 6,536,889 B1 (“Biegelsen et al.”), Dowling et al. U.S. Patent Application Publication No. US 2002/0074559 A1 (“Dowling et al.”), Ostler et al. U.S. Patent Application Publication No. US 2001/0046652 A1 (“Ostler et al.”), Contois et al. U.S. Patent No. 4,980,701 (“Contois et al.”), and Kennedy et al. U.S. Patent No. 5,634,711 (“Kennedy et al.”) are very different than applicant’s method as recited in applicant’s amended Claim 1 and applicant’s other amended claims.

In contrast to applicant’s method as recited in applicant’s amended Claim 1, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not emit visible light from a set of visible light-emitting LED assemblies. Furthermore, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose moving a panel of LED assemblies in proximity to or adjacent UV curable items while light is emitted from LED assemblies, as required in applicant’s amended Claim 1. Significantly, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose uniformly and concurrently applying and distributing first and second wavelengths of UV light on the UV curable items while visible light is emitted as the panel is being moved, as required in applicant’s amended Claim 1. Moreover, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not provide for uniform curing of UV curable items as set forth in applicant’s amended Claim 1.

Furthermore, it is respectfully submitted that Young is not an effective reference because the priority date of January 19, 2003 of applicant’s subject application is before the May 13, 2003 issue date of Young.

Moreover, Biegelsen et al. is not a proper reference against applicant’s claims because the priority date of January 19, 2003 of applicant’s subject application is before the March 25, 2003 issue date of Biegelsen et al.

Dowling et al. pertains to a purifications systems and insect lights and is not germane to applicant’s method for UV curing or emitting UV light on UV curable items, as required by applicant’s amended independent Claim 1 and applicant’s other amended

claims. Also, Dowling et al. is not an appropriate bar reference because it has a June 20, 2002 publication date that is less than one year before applicant's priority date of January 19, 2003 of the subject application.

Ostler et al. pertains to a light-emitting diode source for curing dental composites and provides a system and method that is very different than applicant's claimed method and system.

Contois et al. is directed to an LED print head that includes an optical mask which overlies the LEDs to balance light outputs therefrom for use in recording an image on photographic film or other recording media and is not relevant to applicant's method as recited in applicant's amended Claim 1 and applicant's other claims. Contrary to applicant's method as recited in applicant's amended Claim 1 and applicant's other claims, Contois et al. requires an optical mask of UV fadeable dye whose transmission density is adjusted with a UV laser.

Kennedy et al. is very different than applicant's method as specified in applicant's amended Claim 1 and applicant's other amended claims. Kennedy et al. discloses a portable light emitting apparatus with square-waved generators 100 and saw-tooth generators 102 (a) & (b) and uses a fiber optic taper 34 and optic light guide 38 or optical cap 136. Kennedy et al.'s portable apparatus is primarily used with blue LEDs by dentists for photocuring dental materials (Fig. 1) and the red LEDs for oxidizing cancer cells, collectively referred to as "photo-reaction" (Col. 3, lines 62 et. seq. & Col. 4, lines 1-10).

A prior patent is a reference only for what it clearly discloses or suggests; it is improper use of a patent as a reference to modify it to that which it does not suggest; *In re Hummer*, 113 USPQ 66 (CCPA 1957). See also *In re Stencel*, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987).

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of the other parts necessary to the full appreciation of what such references fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 147 USPQ 391, 393 (CCPA 1965).

Applicant's claims 2-4, 7, 11, and 13 are directly dependent upon applicant's amended independent Claim 1 and, therefore, necessarily require all the method steps, features, and limitations of applicant's amended Claim 1, as well as additional method

steps, features, and limitations, which in combination with the method steps, features, and limitations of applicant's amended Claim 1, are not fairly taught or suggested by Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al.

Applicant's amended independent Claim 16 is directed to an ultraviolet (UV) apparatus for applying UV light to UV photo initiators in UV curable items comprising products, articles, inks, coatings, adhesives, or other objects. In the UV apparatus of applicant's amended independent Claim 16, a set of visible light-emitting diode (LED) assemblies are secured to a panel for emitting visible light. A first array of UV LED assemblies are secured to the panel for emitting a first wavelength of UV light. A second array of UV LED assemblies are secured to the panel for emitting a second wavelength of UV light. The second array of UV LED assemblies are different than first array of UV LED assemblies, and the first wavelength of UV light is different than the second wavelength of UV light. Advantageously, a panel-moving mechanism is provided to move the panel in proximity to or adjacent the UV curable items while light is emitted from the LED assemblies. Desirably, a controller is operatively connected to the LED assemblies and the panel-moving mechanism for uniformly and concurrently applying and distributing the first and second wavelengths of UV light from the UV LED assemblies on the UV curable items while visible light emitted from the visible LED assemblies as the panel is being moved to uniformly cure the UV curable items.

The cited references of Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. are not relevant to applicant's amended independent Claim 16 for many of the reasons indicated above with respect to applicant's amended Claim 1. Furthermore, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose a panel-moving mechanism for moving a panel of LED assemblies in proximity to or adjacent UV curable items while light is emitted from the LED assemblies, as specified in applicant's amended independent Claim 16. Furthermore, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose a controller that is operatively connected to the LED assemblies as well as a panel-moving mechanism to uniformly and concurrently apply and distribute first and second wavelengths of UV light from UV LED assemblies on UV curable items while visible light is emitted from the visible LED assemblies as the panel

is being moved to uniformly cure the UV curable items, as recited in applicant's amended independent Claim 16.

It is submitted that it would not be an obvious matter of choice for one skilled in the art to reconstruct Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. and the other references to achieve applicant's invention as recited in applicant's claims without the benefit of hindsight of applicant's disclosure and such is clearly improper. As the Federal Circuit Court of Appeals (formerly the U.S. Court of Customs and Patent Appeals) has emphasized, the Examiner must be ever alert not to read obviousness into an application on the basis of applicant's own statements and must further view the prior art without reading into that art applicant's teachings, *In re Spinnoble*, 405 F. 2d 578, 160 USPQ 273 (CCPA 1969). It is not enough for a valid rejection of the patent application to view the prior art in retrospect; once applicant's disclosure is known, the prior art should be viewed by itself to see if it fairly discloses what the applicant has done, *In re Schaffer*, 220 F. 2d 476, 108 USPQ 326 (CCPA 1956).

Applicant's amended Claims 18-20, 22, and 27-28 are directly dependent upon applicant's amended independent Claim 16 and, thereby, require all the structural elements, features, and limitations of applicant's amended independent Claim 16, as well as additional structural elements, features, and limitations, which in combination with the claimed elements, features, and limitations of applications amended independent Claim 16 are not fairly taught or suggested by Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al.

Applicant's amended independent Claim 31 is directed to an ultraviolet (UV) curing method for applying UV light to UV photo initiators in UV curable items comprising products, articles, inks, coatings, adhesives, or other objects. In the method of applicant's amended independent Claim 31, UV light is emitted from UV LED chips on a substrate. The UV LED chips are cooled with a variable speed fan and a heat sink. The substrate is moved relative to the UV curable items. Advantageously, the light intensity of the UV light emitted from the UV LED chips are sensed. Desirably, the temperature of the heat sink or UV LED chips is also sensed. In applicant's method of amended independent Claim 31, the speed of the variable speed fan is adjusted and controlled in response the sensed temperature of the heat sink or UV LED chips. Significantly, the temperature of the UV LED chips are maintained at a generally

constant temperature and the light intensity of the UV light emitted on the UV curable items are maintained at a generally constant level so that the UV curable items are uniformly cured.

The cited references of Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. are not relevant to applicant's amended independent Claim 32 for the reasons indicated above with respect to applicant's amended Claim 1. Also, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose sensing the light intensity of UV light emitted from UV LED chips as provided in applicant's amended independent Claim 31. Furthermore, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not sense the temperature of heat sink or UV LED chips, let alone adjust and control the speed of variable speed fan in response to the sensed temperature of the heat sink or UV LED chips, as specified in applicant's amended independent Claim 31. Moreover, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose maintaining the temperature of UV LED chips at a generally constant temperature, let alone disclose maintaining the light intensity of the UV light emitted on the UV curable items at a generally constant level, as recited in applicant's amended independent Claim 31. Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose uniform curing of UV curable items in accordance with the method of applicant's amended independent Claim 31.

A piece meal reconstruction of prior art patents in light of the applicant's disclosure shall not be a basis for obviousness. *In re Kamm & Young*, 172 USPQ 298, 301-302 (CCPA 1972).

Applicant's amended independent Claim 32 is directed to an ultraviolet (UV) curing apparatus for applying UV light to UV photo initiators and UV curable items comprising products, articles, inks, coatings, adhesives, or other objects. In the UV curing apparatus, a set of UV LED chips are mounted on a substrate for emitting the UV light on UV curable items. A heat sink is mounted on the substrate for dispensing heat from the UV LED chips. A variable speed fan is mounted adjacent the heat sink for blowing air on the heat sink or UV LED chips to cool the heat sink or UV LED chips. A moving mechanism is provided to cause relative movement between the substrate and the UV curable items. Advantageously, a light sensor is provided for sensing the

intensity of the UV light emitted from the UV LED chips. Desirably, a control circuit is coupled to the light sensor as well as to the variable speed fan for controlling the light intensity of the UV light emitted from the UV LED chips as well as for controlling the temperature of the UV LED chips by regulating the speed of the air blown from the variable speed fan on the heat sink or UV LED chips and by varying the speed of the variable speed fan in response to the sensed intensity of the UV light to uniformly cure the curable items.

The cited references of Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. are not relevant to applicant's amended independent Claim 32 for many of the reasons indicated above with respect to applicant's amended Claim 1. Furthermore, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose a light sensor for sensing the intensity of UV light emitted from UV LED chips, as recited in applicant's amended independent Claim 32. Moreover, Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al. do not disclose a control circuit that is coupled both to a light sensor and a variable speed fan for controlling the light intensity of the UV light emitted from the UV LED chips, let alone do so by regulating the speed of the air blown by the variable speed fan on a heat sink or the UV LED chips and by varying the speed of the variable speed fan in response to the sensed intensity of the UV light to uniformly cure the UV curable items, as required in applicant's amended independent Claim 32.

Applicant's amended Claims 33 and 37-39 are directly dependent upon applicant's amended independent Claim 32 and, therefore, require all the structural elements, features, and limitations of applicant's amended independent Claim 32, as well as additional structural elements, features, and limitations, such as a temperature sensor for sensing the temperature of a heat sink or UV LED chips, a turntable for carrying printed UV curable items past the UV LED chips, or an oscillator for oscillating or reciprocating the substrate of UV LED chips in proximity to or adjacent the UV curable items as UV light is emitted from the UV LED chips, which are not fairly taught or suggested by Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al.

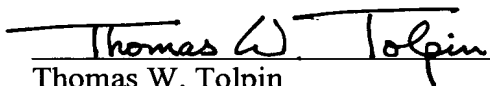
In summary, applicant's method and apparatus, as recited in the amended claims, provides a very useful and user friendly process and equipment for more effectively

curing UV curable items, which are not anticipated or obvious from Young, Biegelsen et al., Dowling et al., Ostler et al., Contois et al., and Kennedy et al.

Inasmuch as the preceding amendment complies with the Primary Examiner's requests, cures the Primary Examiner's objections and patentably distinguishes applicant's remaining claims over the cited prior art references of record, it is respectfully submitted that the above-identified application is now in condition for allowance. A Notice of Allowance is respectfully requested.

The Primary Examiner is invited and encouraged to contact the undersigned attorney in order to expedite this application to allowance, if the preceding does not already place the above-identified application in condition for allowance.

Respectfully submitted,


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